

CLAIMS

What is claimed is:

1. A method for characterizing radial endoluminal irregularity of a vessel, comprising the steps of:

- (a) determining a radial endoluminal outline in a cross sectional image of said vessel;
- (b) determine an area of said endoluminal outline;
- (c) defining a shape with substantially the same area as said endoluminal outline;
- (d) fitting said shape to said endoluminal outline;
- (e) calculating an irregularity index which is the ratio of at least a part of said
endoluminal outline and the outline of said fitted shape corresponding to said at
least a part of said endoluminal outline; and
- (f) visualizing said irregularity index.

2. The method as set forth in claim 1, wherein said image is a computed tomography
angiograph.

3. The method as set forth in claim 1, wherein said vessel is an infrarenal aorta or a
common iliac artery.

4. The method as set forth in claim 1, wherein said vessel is an aneurysmal vessel.

5. The method as set forth in claim 1, wherein said step of determining said radial endoluminal outline comprises the step of using edge detection or adaptive thresholding.

5 6. The method as set forth in claim 1, wherein said step of determining said radial endoluminal outline comprises the step of filtering.

7. The method as set forth in claim 1, wherein said radial endoluminal outline only includes the flow channel of said vessel and excludes calcium or a mural thrombus.

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8. The method as set forth in claim 1, wherein said shape is a circle, an ellipse or a sphere.

15 9. The method as set forth in claim 1, wherein said visualization comprises colors, numbers or labels.

10. The method as set forth in claim 1, wherein said visualization is done with reference to a range of irregularities encountered in normal patients and in patients with a vascular disease.

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11. The method as set forth in claim 1, further comprising the step of modifying said irregularity index by the distance of said endoluminal outline from said corresponding part of said fitted shape.

5 12. A method for assessing stent-graft attachment sites in a vessel prior to endovascular repair, comprising the steps of:

(a) determining radial endoluminal outlines in cross sectional images of potential stent-graft attachment sites in said vessel;

(b) determining an area of each one of said endoluminal outlines;

10 (c) defining, for each one of said endoluminal outlines, a shape with substantially the same area as said endoluminal outline;

(d) fitting said shape to said endoluminal outline;

(e) calculating an irregularity index which is the ratio of at least a part of each said endoluminal outline and the outline of said fitted shape corresponding to said at least a part of said endoluminal outline; and

15 (f) visualizing said irregularity index with reference to a range of irregularities encountered in normal patients and in patients with a vascular disease.

20 13. The method as set forth in claim 12, wherein said image is a computed tomography angiograph.

14. The method as set forth in claim 12, wherein said vessel is an infrarenal aorta or a common iliac artery.

15. The method as set forth in claim 12, wherein said vessel is an aneurysmal vessel.

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16. The method as set forth in claim 12, wherein said attachment sites are the proximal and distal attachment sites.

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17. The method as set forth in claim 12, wherein said step of determining said radial endoluminal outlines comprises the step of using edge detection or adaptive thresholding.

18. The method as set forth in claim 12, wherein said step of determining said radial endoluminal outlines comprises the step of filtering.

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19. The method as set forth in claim 12, wherein said radial endoluminal outlines only includes the flow channel of said vessel and excludes calcium or a mural thrombus.

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20. The method as set forth in claim 12, wherein said shape is a circle, an ellipse or a sphere.

21. The method as set forth in claim 12, wherein said visualization comprises colors, numbers or labels.

22. The method as set forth in claim 12, further comprising the step of modifying said
5 irregularity index by the distance of said endoluminal outline from said
corresponding part of said fitted shape.

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